REMARKS

Status of the Application

Claims 1-17 are pending and stand rejected.

Specification

In response to the objection to the specification, applicant has amended paragraph 0009 and claim 6 and cancelled claim 15.

Section 102 Rejections of Claim 1

Claims 1, 2 and 7 have been rejected under 35 U.S.C. Section 102 as being anticipated by Ebeling et al. US 4,661,130. Claims 1 and 2 have also been rejected as being anticipated by Bowman US 2,070,578. In response applicant has amended claim 1 and submits that claim 1 is now allowable over Ebeling and Bowman for at least the following reason(s).

The invention solves a different problem than that of the prior art

As an initial matter, and as is now explicitly stated in the preamble to claim 1, applicant's claimed invention solves the problem of removing solid particulates, acids, heavy metals, contaminate gases or other contaminates from industrial exhaust gases. Neither Ebeling or Bowman solves this problem or, for that matter, disclose a device as versatile as applicant's. Ebeling solves the quite different problem of removing water from natural gas by using a "liquid desiccant" (Ebeling at col. 1, lines 7-8 and 32-34). Bowman solves the problem of removing dust and other fine particles from gases (Bowman at page 1, left hand column, lines 1-15), but not other contaminates such as acids and contaminate gases.

As for the other references, none teaches a device for removing both particulates and non-particulates from a gas. Teller US 3,957,464 teaches a device for removing particulates from industrial exhaust gases. Teller does not mention removing non-particulates, such as acids or

contaminate gases. Saletan US 4,247,532 teaches a device for removing chemical impurities, including sodium carbonate, ammonia, air, oxygen and hypochlorite and percholate compounds from commercially produced chlorine vapor (Col. 1, lines 23-36), but not particulates. Klingspor US Pub. No. 2002/0110511 teaches a device for removing sulfur compounds from flue gas (Paragraph 0002).

Only the present invention is designed to remove both solid particulates and non-solid (liquid or gaseous) contaminants from exhaust gas. As will now be explained, this difference in function results in several significant differences in the design and construction of applicant's gas scrubbing device versus the prior art devices.

1. Neither Ebeling or Bowman teaches using a liquid solution as a removal medium

Applicants' Claim 1 requires a "liquid solution" for removing contaminates in a first stage of the device. A "solution" is a homogenous mixture of a solid dissolved in a liquid which, in applicant's invention, can be a brine solution (salt dissolved in water). By contrast, Ebeling teaches using a "liquid desiccant, that is, a liquid having capability of absorbing water from gas, such as glycol…" (Ebeling at col. 4, lines 5-6) Glycol is not a "liquid solution." Bowman teaches using "an emulsion or froth consisting of oil and a washing liquid such as water…" (Bowman at page 1, left hand column, lines 9-10. An emulsion is not a solution, that is, not a homogenous mixture of a solid dissolved in a liquid, but rather a liquid (oil in this case) dispersed in another liquid (such as water). For this reason alone applicant's claimed invention is patentably distinguishable from Ebeling and Bowman.

2. Neither Ebeling or Bowman teaches a device in which the gas contacts the scrubbing medium for approximately 4-10 seconds

Claim 1 as amended incorporates the limitation of cancelled claim 8 that the exhaust gas contacts the scrubbing medium (liquid solution) for 4010 seconds. This limitation, supported in the specification as filed at paragraph 0029 and a function of, among other things, the height of the tank, is critical for adequate removal of all the contaminates from the exhaust gas.

Neither Ebeling nor Bowman teach this important limitation. As the Examiner acknowledges on page 3 of the Office Action Ebeling makes no mention of the retention time of the natural gas within the removing medium (glycol). Likewise, Bowman makes no mention of the retention time of the bubbles in the removing medium (oil-water froth)

In addressing claim 8 the Examiner asserts that it "would have been obvious to modify the contact time of the bubbles in the tank [of Ebeling] to provide an optimum level of gas/liquid contact for removal of contaminates..." Perhaps, but neither Ebeling, Bowman or any of the other prior art references teach that the retention time should be 4 -10 seconds as required in amended claim 1. Besides, as noted above, Ebeling and Bowman are directed to solving different problems, and so their "optimum level" of gas liquid contact would probably be different from that required by applicant's claimed invention. For this second reason claim 1 is patentably distinguishable from the prior art.

3. Neither Ebeling nor Bowman teaches using an aeration stone

Another critical aspect of applicant's invention as recited in amended claim 1 is that the exhaust gas fed into the tank be dispersed into "small gas bubbles having an average diameter of less than about 1.0 mm". This is accomplished by using the "aeration stone" now recited in amended claim 1. Both the aeration stone and the average gas bubble diameter are supported in the specification as filed at paragraph 0026.

Neither Ebeling nor Bowman teach either of these new claim 1 limitations. Instead, both Ebeling and Bowman teach using perforated bubble caps, with the resulting bubbles having an unspecified diameter.

For at least the above three reasons applicant respectfully submits that claim 1 and its dependent claims 2-7 are allowable over the prior art.

Rejections of claims 8-17 under Sections 102 and 103

With regard to the rejections of claims 8-17, applicants request cancellation of these claims.

Summary

It is believed that this paper constitutes a complete response to the Office Action mailed May 4, 2009, and an early and favorable action allowing claims 1-7 and 9 is respectfully requested. The Examiner is invited to telephone Applicant's undersigned attorney if any unresolved matters remain.

Respectfully submitted,

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